

**NICARAGUA**

**ARAP**

**Agriculture Reconstruction Assistance  
Program**

**ANALYSIS OF TEA PRODUCTION POSSIBILITIES**  
**IN NICARAGUA**

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*To:*  
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## ***Analysis of Tea Production Possibilities for Nicaragua***

### **1. Introduction**

The objective of the mission is to analyse the potential for tea production in Nicaragua and, if positive from an agro-climatological basis, examine the cost-benefit aspects to ascertain the viability of tea production.

The results of the mission were discussed in a seminar with potential interested parties.

### **2. General information about tea production**

#### **2.1. Soil & climatic requirements.**

Tea can be grown from zero to 2800 m. altitude on soils that have a pH of 4.5 – 6.0 and contain 30-60% free aluminium. Rainfall requirement is an annual minimum of 1500mm, ideally equally distributed over 12 months, but in any case with a maximum of 3 months having less than 50mm. of rain. Sunshine hours are important and lengthy periods without direct sunlight cause fungal diseases to thrive.

Elevation and ambient temperature are direct factors determining the quality of black tea produced in a given location. It is correct to say that the higher the elevation, the better the black tea quality and thus the higher the market price.

#### **2.2. Tea Farming systems**

##### **2.2.1. Traditional plantation**

Tea planted in adjacent blocks round a central processing plant all under one ownership

##### **2.2.2. Smallholder system**

A central factory furnished with green leaf by smallholder farmers having plots of tea from .5ha upwards.

##### **2.2.3. A mixture of the two.**

The factory is usually privately owned and has its nucleus plot of 1-200 Ha of tea, which guarantees some production and also serves as demonstration area for the small farmers.

### 2.3. Size of production unit

The minimum economical size of a processing plant is 800-1000 MT of black tea per year. On a commercial plantation at 1500 Meters altitude this could be produced with 300 ha. of plantation. Under a smallholder scheme the yield/ha is reduced for various reasons and 600 ha of tea would be required

2.4. In the seminar a brief description of tea growing and processing was given, covering the following aspects:

- The planting of clonal cuttings in nurseries
- The plucking and pruning of the tea bush
- Leaf transport to the factory
- Withering – the process of removing surface moisture and body moisture from the tea
- Rolling – the rupture of cells in the leaf and the twisting and curling of the leaf
- Fermenting – correctly called oxidation of the leaf. This is the chemical action which determines “quality” of the black tea.
- Drying – the conversion of wet to dry tea
- Sorting – the grading of the black tea into different sized particles.

A series of slides were shown to show these processes in various parts of the world.

### 2.5. Markets.

World consumption continues to rise slowly, mainly in the developing countries such as India & Pakistan. However production is also increasing and the demand for lower quality tea is not great and this is reflected in the low prices obtained.

Demand in Central America appears to be increasing – imports in 1990 of 170 Metric tons rose to 350 MT by 1994. An increase of 100% in only 4 years!

From the little information available it seems that tea consumption in Nicaragua is minimal and the marketing strategy should aim at exports in packets and teabags to the Central American market together with an effort to increase local consumption.

There is no producer of quality tea in the Americas and a niche exists for Nicaragua to fill. The advantage of a Pacific port for export to Chile and West USA is important.

### **3. Field Investigations**

The consultant, accompanied by agronomists from the staff of Chemonics, visited as many potential sites as was feasible in the time allowed and covered a distance of over 2,500 km.

Four primary critical conditions were examined at each site. In order to be suitable for tea production the site had to satisfy all four conditions:

- The soil had to be of correct acidity
- Rainfall 1500mm or above and a maximum of 3 months with rainfall less than 50 mm.
- 600 hectares of land had to be available for tea within a 20 km radius
- Available land to have a slope of less than 45°

The results of the survey were as follows: -

<b>Location</b>	<b>Soil Suitable</b>	<b>Rainfall Distribution</b>	<b>Land Available</b>	<b>Land Suitable</b>
Las Camelias El Encanta Ural La Explosion	Yes	Doubtful	Little	No
Los Nubes	Yes	Doubtful	No	No
La Laguna	Yes	Doubtful	No	No
Lomo Frio	Probable	No	Some	No
Miraflor	Yes	Doubtful	Yes	Yes
Cordillera Isabella El Bote Tasua Carquita Zinica	Probable To be Tested	Possible	Yes Below 1000 meters	Yes
Plan de Grama Kilambé	Probable To be Tested	Probable	Probable	Probable

From the above table it is seen that on initial examination the following areas are possible potential tea production areas:

- Kilambé
- Miraflor
- Cordillera Isabella

The area to the East of the Cordillera Isabella is included as a possible area but its altitude of less than 1000 meters makes it less attractive.

Unfortunately the most promising area, around Kilambé, was not visually inspected due to problems fording a river and the subsequent breakdown of our vehicle. Observations are therefore from hearsay but repeated from several parties independently. This information must be verified to support the info given in the table.

The areas listed below must be excluded:

- El Encanta
- Las Camelias
- Ural
- La Explosion
- Los Nubes
- La Laguna
- Lomo Frio

#### **4. Economics**

The installation of a tea project is a complex and expensive operation. To produce black tea of a standard acceptable to the world market and using the minimum economic production unit of 800-1000 MT/year the investment in the processing plant and associated infrastructure alone would be in the region of 3-4 million U.S.\$

A further US\$ 2-3 Million would be necessary to plant the 600 ha and to provide a system of roads and leaf collection points.

A relatively small investment is in a packaging plant which gives a high return as most of the profit in the tea industry is in the added value of packing. For example a packet of 12 tea bags bought in Estelí cost C\$12.25. This is equivalent to US\$ 38 per kg of tea – tea which in bulk costs \$2 !

In the following pages examples of projected costs and income can be seen for tea grown over 1400 Meters and below 1400 Meters. This only deals with the plantation aspects of the operation

Factory profitability cannot be realistically calculated without a full scale feasibility study but in general terms manufacturing costs, excluding green leaf purchase, can be estimated at around US\$ 0.50 per kg of black tea. Using the same projections as for the plantation examples, a high elevation factory operating at full capacity would show an annual profit of around US\$425,000 whereas a low elevation factory would only show a profit of US\$185,000.

Added value of packaging is not taken into account as the market potential is unknown.

cost establishment 1 ha clonal tea (nucleus estate)																	
>1400 Metres altitude																	
		cost of manday (US\$)	2.00														
		sale price geen leaf	0.180	US\$				1.20	£								
item	year 1			year 2		year 3		year 4		year 5		year 6		year 7		year 8	
	units	rate	cost	units	cost	units	cost	units	cost	units	cost	units	cost	units	cost	units	cost
land preparation	51	2.00	102.00		-		-		-		-		-		-		-
planting	150	2.00	300.00		-		-		-		-		-		-		-
cost of plants	16000	0.125	2,000.00		-		-		-		-		-		-		-
fertilizer	500	0.50	250.00	500	250.00	500.00	250.00	350	175.00	350	175.00	350	175.00	350	175.00	350	175.00
applications	15	2.00	30.00	15	30.00	15.00	30.00	15	30.00	15	30.00	15	30.00	15	30.00	15	30.00
herb/insecticides	est		32.00	est	32.00	est	32.00	est	32.00	est	32.00	est	32.00	est	32.00	est	32.00
weeding etc	32	2.00	64.00	48	96.00	48.00	96.00	48	96.00	36	72.00	36	72.00	36	72.00	36	72.00
tools	est		40.00		-		-		-	est	40.00						
pruning		2.00	-	20	40.00	20	40.00		-	30	60.00	30	60.00	30	60.00	30	60.00
tipping/plucking		2.00	-		-	100	200.00	200	400.00	320	640.00	480	960.00	640	1,280.00	640	1,280.00
			-		-		-		-		-		-		-		-
sale of leaf		0.18	-		-	2,000	360.00	5,000	900.00	8,000	1,440.00	12,000	2,160.00	16,000	2,880.00	16,000	2,880.00
			-		-		-		-		-		-		-		-
net gain			(2,818.00)		(448.00)		(288.00)		167.00		391.00		831.00		1,231.00		1,231.00
acc net gain			(2,818.00)		(3,266.00)		(3,554.00)		(3,387.00)		(2,996.00)		(2,165.00)		(934.00)		297.00

cost establishment 1 ha clonal tea (smallholder)																			
>1400 Metres altitude																			
		cost of manday (US\$)		-															
		sale price geen leaf		0.180															
item	year			year		year		year		year		year		year		year			
	1			2		3		4		5		6		7		8			
	units		cost	units	cost	units	cost	units	cost	units	cost	units	cost	units	cost	units	cost		
land preparation	51	-	-		-		-		-		-		-		-		-		
planting	150	-	-		-		-		-		-		-		-		-		
cost of plants	16000	0.050	800.00		-		-		-		-		-		-		-		
fertilizer	500	0.50	250.00	500	250.00	500.00	250.00	350	175.00	350	175.00	350	175.00	350	175.00	350	175.00		
applications	15	-	-	15	-	15.00	-	15	-	15	-	15	-	15	-	15	-		
herb/insecticides	est		32.00	est	32.00	est	32.00	est	32.00	est	32.00	est	32.00	est	32.00	est	32.00		
weeding etc	32	-	-	48	-	48.00	-	48	-	36	-	36	-	36	-	36	-		
tools	est		40.00		-		-		-	est	40.00								
pruning		-	-	20	-	20	-		-	30	-	30	-	30	-	30	-		
tipping/plucking		-	-		-	100	-	200	-	200	-	300	-	300	-	300	-		
			-		-		-		-		-		-		-		-		
sale of leaf		0.180	-		-	1,500	270.00	3,000	540.00	5,000	900.00	7,500	1,350.00	7,500	1,350.00	7,500	1,350.00		
			-		-		-		-		-		-		-		-		
net gain			(1,122.00)		(282.00)		(12.00)		333.00		653.00		1,143.00		1,143.00		1,143.00		
accum. Net gain			(1,122.00)		(1,404.00)		(1,416.00)		(1,083.00)		(430.00)		713.00		1,856.00	381	2,999.00		

Note return from 381 days labour is US\$1,143 – equal to \$3.00 per man-day

Note that the cost of planting material to the farmer has been assumed to be subsidised.



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Note return from 481 days labour is US\$1,068 – equal to \$2.22 per man-day

Note that the cost of planting material has been assumed to be subsidised.

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## **5. Immediate necessary actions**

- Confirmation that the rainfall distribution falls within the accepted limits – over 1500mm distributed over 9 months with a maximum of 3 months having less than 50mm rain.

**This means that rain gauges should be installed at strategic points in the designated areas and personnel designated to collect the data.**

- Confirmation that the soil is suitable. – pH 4.5–6.0, 30-60% free aluminium

**This is easily done by collection of samples for local analysis**

Once we have confirmation that the sites are suitable for planting tea a decision must be taken, preferably by Government, to go ahead with the introduction of Tea as a non-traditional crop for Nicaragua.

As soon as possible the following steps should then be taken:

- Importation of clonal cuttings and establishment of nuclei in each zone for future propagation.
- Selection of willing participants in a tea-growing project.
- A full scale feasibility study to include project design

As a result of the seminar and interest shown by the manager of ISNAYA, a small plant in Estelí which packs herbal teas, it is recommended that he be assisted to

- import a small quantity of black tea to pack to compete with tea sold on the local market but packed in El Salvador and in Costa Rica
- import a quantity of genetic material to plant in suitable soil under irrigation so he can produce his own black tea for local sale.

It was also requested in the seminar that rainfall distribution data be ascertained around Masigüe, where the farmer concerned estimated a dry season of only 2 -3 months.

It is possible that great enthusiasm will not be forthcoming from investors and farmers until a working model is shown to them and it may therefore be necessary for the state to request donor assistance to create the first tea project in Nicaragua. This is easily justified by the socio-economic benefits which would arise in areas which have soils suitable for no other crop and with high levels of unemployment.